



University of California
**Capital Program Risk
Assessment**
University-Wide Report

August 10, 2001

University of California
Office of the President

Final Steering Committee Report on the
UC Capital Program Risk Assessment



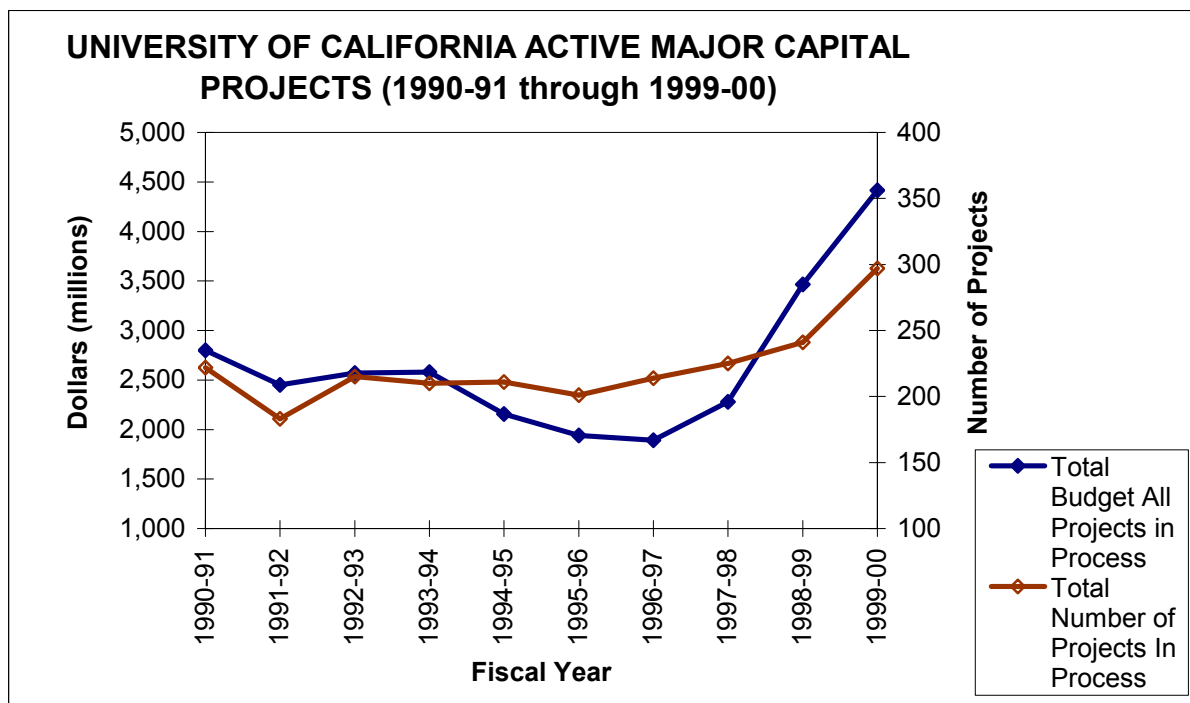
Executive Summary

August 10, 2001

Background

Over the years, the University has examined how it manages its capital program. Such examinations took place in 1978 in response to state budgetary cuts and again in 1989 in recognition of projected growth in the capital program. In late 1998, the University initiated this most recent study of its readiness to manage projected long-term growth of the capital program, driven in part by an anticipated enrollment growth of approximately 60,000 students through 2010-11. This enrollment growth alone requires unprecedented levels of construction of facilities for housing, classrooms, offices, research, and related infrastructure. Moreover, advances in technology are requiring increasingly complex facilities that are adaptable to rapidly changing instructional and research needs. Finally, the University must also address the significant renewal needs of an existing building and infrastructure inventory, much of which is nearing the end of its useful life and/or requires significant seismic upgrading. All of these factors increase the demands on the University's personnel and delivery systems, as well as on the third-party community of design professionals and contractors.

The chart below displays the number and dollar volume of major capital projects at the end of each fiscal year for the past 10 years.



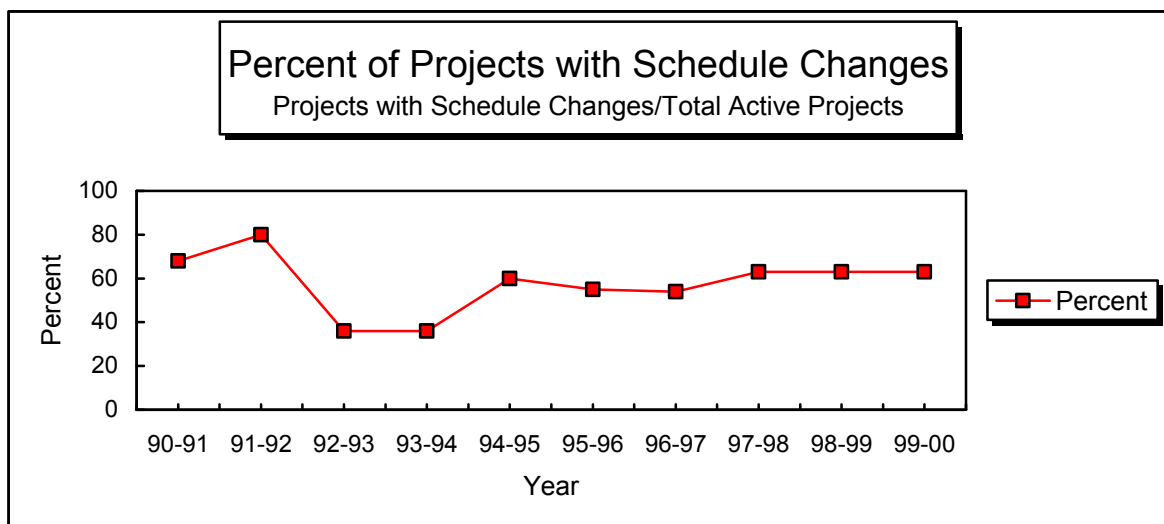
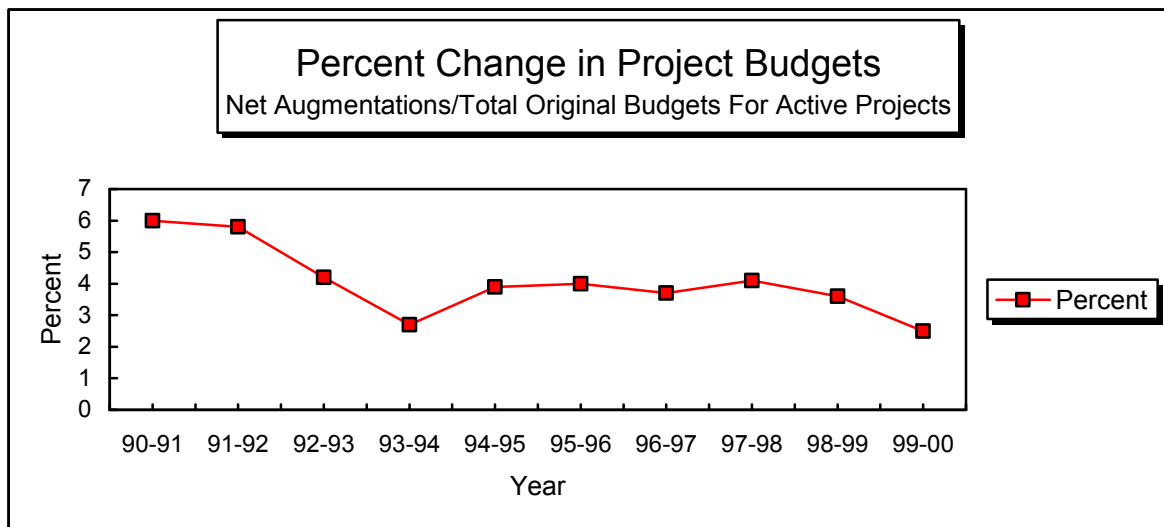
The increased level of activity was first apparent in 1997-98 and has continued to accelerate over the most recent two fiscal years. The number of approved active projects has increased 32% and the dollar volume has increased 95% over the last two years. This represents a total program growth of \$2.2 billion in two years on a base of \$2.3 billion in 1997-98.

This growth in the University's program has occurred in tandem with the state's demographic and economic expansion, a national economic boom, and the resulting boom in the construction industry. University projects compete for the same design industry and contractor skills and the same labor and material pools as high-technology companies, pharmaceutical firms, other segments of the education community, and large-scale public works projects. All of these

factors have affected the number, pricing, and quality of bids received on many major University capital projects. One additional factor that impacts the University is the public-sector budgeting process that oftentimes requires establishing and approving budgets and programs up to two and a half years before a project is bid for construction, rendering construction cost index projections ineffective. In summary, the University has experienced, and may continue to experience, an over-heated construction economy at the same time that it must build or significantly upgrade more facilities of greater complexity at all locations throughout the state.

Past Performance Indicators

The University has been tracking and reporting on two internal performance benchmarks: (1) percent change in project budgets, defined as net augmentations to original budgets; and (2) percent of projects with schedule changes. The 10-year results for these two measures are shown in the charts below.



The 10-year trend for total net budget augmentations shows a decrease from 6.0% to 2.5%, with the most recent year seeing a decrease from 3.6% to 2.5%. The 10-year trend also shows

that the university has reduced the percentage of projects subject to schedule changes from 68% to 80% in 1990-91 and 1991-92 to a relatively stable level of 54% to 63% over the past six years. It is important to note that not all budget augmentations and schedule changes represent undesired outcomes. Many such changes are driven by intentional decisions beneficial to the University's overall mission, such as program changes responding to changed circumstance, new or augmented funding opportunities allowing for program improvements, or the logistical needs of multiple project phasing, particularly on older more built out campuses.

These charts of project budget and schedule changes provide a picture of the past and recent trends and, as such, represent "lagging" indicators of how the University's capital program is performing. These indicators suggest that despite rapid year-to-year increases in program volume and complexity, the capital program has continued to perform relatively well.

Overview of the Current Risk Assessment Effort

In late 1998, Senior Vice President Kennedy appointed four outside experts in capital project delivery to serve on the Capital Program Task Force to examine UC's readiness to successfully implement the overall capital program. At that time, the University's capital program had grown to over \$3.5 billion, an increase of over 50% in less than five years. The Capital Program Task Force issued its final report in July 1999 containing broad observations and recommendations to improve UC's ability to deliver capital projects.

As an extension of the work of the Task Force, Senior Vice President Kennedy initiated a risk assessment process in early 2000 under the auspices of the Controller's Business Controls and Risk Assessment Initiative. The risk assessment process was designed to provide a more in-depth examination of UC's readiness to implement the capital program by identifying system-wide program risks and analyzing current day-to-day operating practices. Each campus nominated its senior capital program delivery administrator to participate on a Risk Assessment Steering Committee with the charge to: (1) identify the major system-wide risks associated with the rapidly expanding capital program, (2) guide a process to inventory and evaluate current business practices, and (3) recommend actions that the University could take to improve the management of its capital program.

The attached report, representing an year and a half effort of the Risk Assessment Steering Committee, presents a quantitative and qualitative assessment of the University's overall readiness to manage the delivery of its capital projects, including recommendations for future activities that would strengthen capital program management and project delivery.

Assessment Report Summary Observations

The Steering Committee originally identified 28 potential system-wide risks that could impact the success of the University's capital program. After discussing each of these risks, the committee decided to focus on 10 of the risks that, in its opinion, have the greatest potential for impact on the success or failure of a project. Based upon the results of focus group meetings at each location, campus and OP staff assessed the University's overall readiness to manage the top ten capital program risks on a 1-to-9 readiness scale, with 1 indicating unacceptable and 9 representing acceptable readiness to manage the related risk. The University's overall readiness rating was measured at 5.4 on the readiness scale.

This overall readiness rating suggests that campus and OP staff involved in the delivery of capital projects believe that current University business practices need some improvement to increase efficiency, yet certain practices across the system are generally effective. This

quantitative readiness scoring should be reviewed in conjunction with the extensive qualitative information gathered during the focus group discussions and contained in an appendix to the report. This information provides a rich and thorough portrait of current practices related to the management of these risk factors throughout the University and documents suggestions by focus group participants for future activities that could strengthen program readiness.

It is not surprising that those risk areas driven primarily by forces external to the campuses received the lowest assessment of readiness. This assessment was most likely magnified by the prevailing conditions in the state and national construction markets over the past two to three years. For example, despite the documented variety of efforts by campuses to recruit and retain quality staff, the public-sector aspects of compensation and working conditions were continuously cited as impediments to maintaining adequate quality and numbers of staff for the increased workload. Limitations of the University's capital budget process were also cited as exacerbating difficulties in managing capital projects by limiting resources available to plan and manage many projects. All campuses indicated that they receive very limited or no non-project based funding for staffing of the A&E and project management portions of the project delivery process. This reliance on project budgets to support project management grew out of the severe budget reductions of the early 1990's, when funding was shifted away from the capital program to support other priorities. For the most part, that funding has not been redirected to the capital program, even though the University's capital construction activity has more than doubled in the last several years.

All locations have developed systems and procedures designed to mitigate the business risks inherent to the design and construction of large and complex capital projects. It is also evident that while the University has avoided major failure to achieve its program objectives, the capital delivery infrastructure is under stress at most locations and in many areas of the process. There is great pressure to deliver multiple and oftentimes complex projects on aggressive schedules, sometimes with insufficient qualified staff and inadequate management and systems support and resources. Focus group discussions highlighted considerable diversity of campus efforts to manage each risk. As such, there is a real opportunity to share best practices and knowledge gained with each new project.

As discussed earlier, the Steering Committee and ten focus groups were asked to assess program readiness during fiscal year 2000-01, a time of continued growth of the capital program that has placed further burdens on the delivery processes. It should be noted that the dimensions of that growth, and the impact on the annual performance measures, will not be fully known for another several months. The focus group participants were largely the key campus individuals responsible for the day-to-day management and implementation of the project delivery process. These are the individuals responsible for setting priorities and triaging resources among competing demands to ensure delivery of an ever-increasing number and variety of complex building projects.

The readiness scores provided by the risk assessment process, and detailed in the full report, may be viewed cumulatively as a possible leading indicator of the confidence level these key players have in their ability to continue to perform at past levels of proficiency. Based upon the readiness rankings provided, the recommendations outlined at the end of the full report provide valuable insights into actions that could mitigate many of the concerns expressed throughout this evaluation process. Those actions, if incorporated into campus and Office of the President management and budgetary strategies, could serve to maintain or even improve on the positive results of the past decade.

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Project Background

Capital Program Task Force

In late 1998, Senior Vice President Kennedy appointed four outside experts in capital project delivery to serve on the Capital Program Task Force to examine UC's readiness to successfully implement the overall capital program. At that time, the University's capital program had grown to over \$3.5 billion, an increase of over 50% in less than five years. The Task Force issued its final report in July 1999. The report contained broad observations and recommendations to improve UC's ability to deliver capital projects. These observations and recommendations are helping to guide strategic planning for the University's capital program.

Capital Program Risk Assessment

As an extension to the work of the Capital Program Task Force, the Office of the President initiated a process to identify and understand the risks and management practices associated with the expanded capital program. Under the guiding principles of the University's Business Controls and Risk Assessment Initiative, Deloitte & Touche was retained to facilitate an assessment, conducted by University personnel, of the University-wide capital program. The overall goal of the business risk assessment was two-fold:

- Provide a more in-depth examination of UC's readiness to implement the capital program by identifying system-wide program risks and analyzing day-to-day operating practices of campus and OP personnel; and
- Recommend steps and actions that the University should take to improve the management of capital program risks.

Risk Assessment Process Overview

The following section provides an overview of the process used for the Capital Program Risk Assessment.

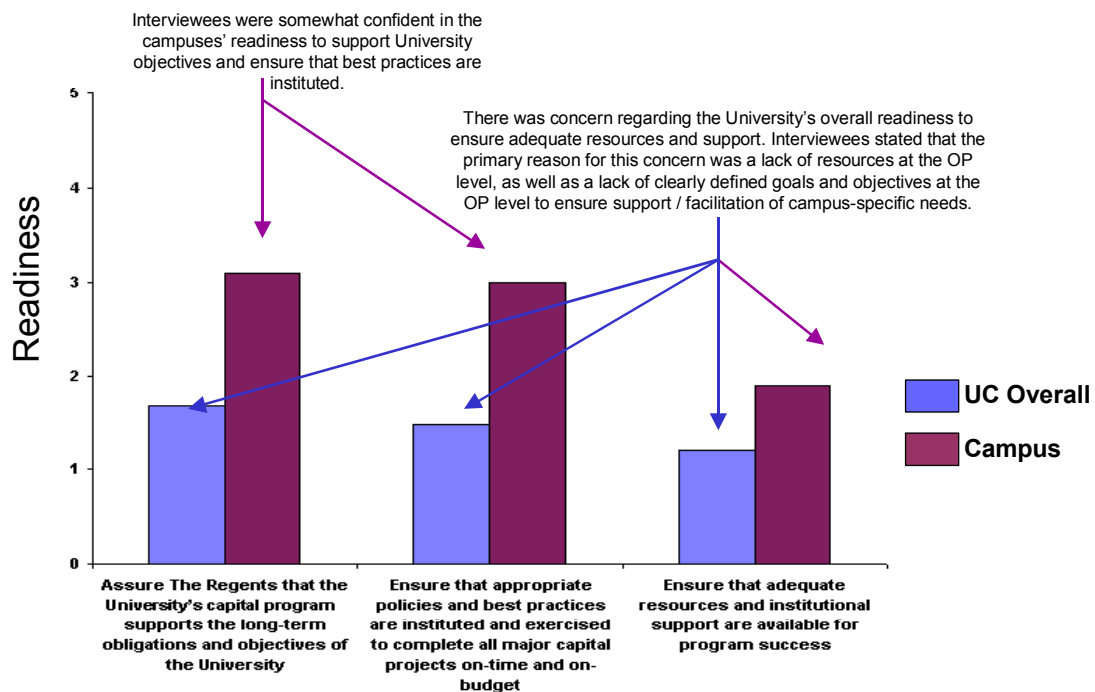
Risk Assessment Steering Committee Activities

In February 2000, each UC location was requested to nominate an individual to participate on a University-wide Risk Assessment Steering Committee. This committee was established to identify the major risks associated with the University's capital program (which had grown to nearly \$4 billion) and to guide a process to inventory and evaluate current University Capital Program delivery business practices.

During the months of March and April 2000, one-on-one interviews were held with each Steering Committee member to: (i) introduce the concepts of a risk assessment framework, (ii) discuss University-wide and campus operational objectives of the capital program, and (iii) identify key risks that could impact the University's ability to achieve these objectives.

During the individual interviews, each Steering Committee member was asked to assess, using a scale of 0 to 5 (0 being the least ready and 5 being the most ready), the level of readiness of their campus and of the University as a whole to meet the University-wide objectives of the expanding capital program. The chart below displays the consolidated readiness assessment of the ten Steering Committee members.

Readiness to Meet Capital Program Strategic Objectives



This chart shows that individual locations have a higher level of confidence in their own readiness than in the readiness of the University as a whole. Reviewing these results, Steering Committee members suggested that the lower confidence expressed in the readiness of the University as a whole may be attributed to a lack of knowledge each campus has regarding practices at other campuses. They agreed that even a rating of “3” does not express a high degree of confidence in campus readiness. There was further agreement that additional inquiry was required to identify the issues and potential areas for improvement to increase confidence.

In May 2000, the Steering Committee met to accomplish the following:

- Review strategic planning efforts by the OP Facilities Administration Department designed to address recommendations of the Task Force;

- Review the strategic objectives and the campus operating objectives for the University's capital program;
- Discuss campus observations regarding the overall University and campus readiness to meet the capital program strategic objectives;
- Validate and prioritize the 28 capital program delivery risks that were identified during the interviews; and
- Establish a process to inventory campus and OP business practices currently in place to manage the top 10 prioritized risks.

The majority of the May 2000 meeting was devoted to a discussion by the Steering Committee members regarding the potential impacts and contributing factors of each of the 28 risks originally identified during the one-on-one interviews (Appendix B lists all 28 risks). Following these discussions, which included clarifications of language to achieve a common understanding of each identified risk, anonymous voting technology was used to prioritize the risks based upon likelihood of occurrence and degree of impact on achieving program objectives if it occurred. This process resulted in the identification of ten priority risks as having the greatest potential for adverse impact on the University's ability to meet capital program objectives.

Campus Focus Group Activities

The Steering Committee agreed to convene a Focus Group at each location for the purpose of conducting an in-depth review of how each location is affected by and seeks to mitigate the prioritized risks. Each Focus Group was directed to carry out the following:

1. Identify current business practices in place to manage each of the ten key program risks identified by the Steering Committee;
2. Assess the readiness of the location to manage each of the prioritized risks;
3. Identify future actions that could serve to improve the University's management of its capital program; and
4. Identify 'best practices' that could be shared with other locations across the UC system.

Leadership for each risk assessment session was provided by the location's respective Steering Committee member, with coordination and resources provided by the Office of the President and Deloitte & Touche. Each location was encouraged to include in its Focus Group a broad range of campus staff in the design and construction, capital budget planning, physical plant, and contract administration functional areas. The ten Focus Groups met between June and September 2000 and had a total of 103 participants (see Appendix A for a list of all participants). Quantitative and qualitative information obtained from these sessions is to be used by the Steering Committee to evaluate the University's system-wide readiness to successfully implement the Capital Program.

Assessment Results

The following section summarizes the results of the Steering Committee activities in addition to the results of the ten risk assessment focus group sessions.

Program Objectives

At their May 2000 meeting, the Steering Committee members agreed with the following high-level objectives of the Capital Program:

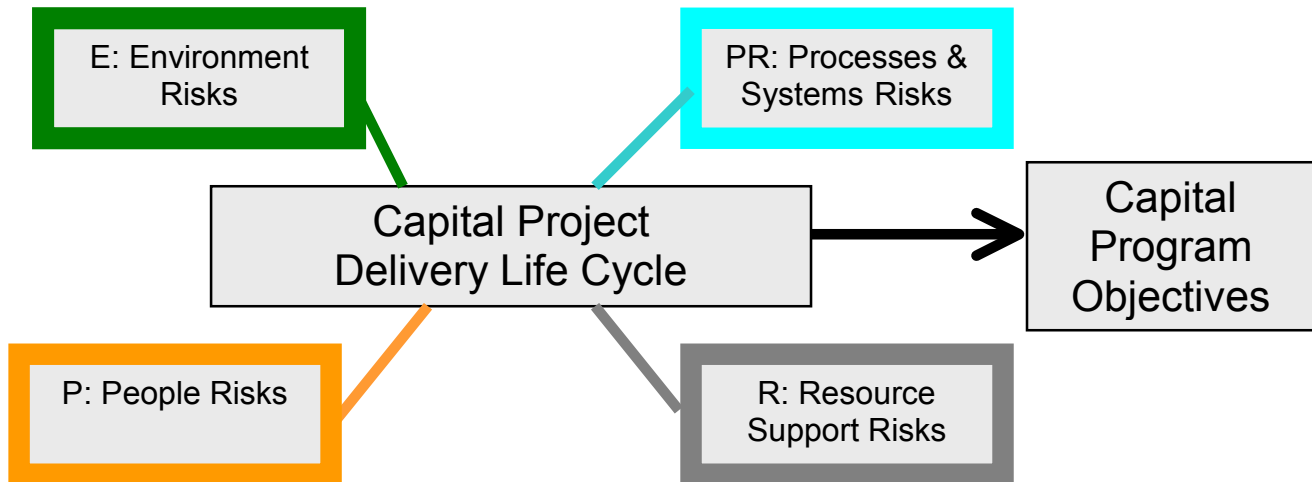
- Assure The Regents that the University's capital program supports the long-term obligations and objectives of the University;
- Ensure that appropriate policies and best practices are instituted and exercised to complete all major capital projects on-time and on-budget; and
- Ensure that adequate resources and institutional support are available for program success.

In addition, Steering Committee members discussed 18 campus operating objectives identified during the one-on-one interviews with the Steering Committee members that preceded the May 2000 committee meeting. Following the discussion of the importance and general applicability of each of these objectives, Steering Committee members voted to identify those objectives that could be classified as core risks to the capital program at all campuses (Appendix C contains a listing of these campus objectives and a chart showing the ranking of each). Although some campuses might place greater emphasis on one or more additional operational objectives, Steering Committee members selected and reached agreement on the following eight core campus objectives:

- Establish an inclusive, interactive relationship between all campus capital project functional units;
- Design contextually sensitive buildings that support and meet program objectives, and also add to the quality of the environment by improving the neighborhood;
- Establish effective on-line project data management systems;
- Hire and retain quality project managers;
- Maintain appropriate project documents and processes;
- Align project budget and design with life-cycle costs;
- Implement appropriate pre-planning studies and analyses; and
- Effectively manage internal client involvement.

Program Risks

Following detailed discussions of the 28 risks previously identified by Committee members (Appendix B), anonymous voting technology was used to prioritize the top ten risks. To facilitate discussion of the ten priority risks identified by the Steering Committee, they were grouped into four general types of impacts on the capital project delivery life cycle as depicted in the diagram below:



The top ten Risks identified for the campus Focus Group assessment sessions (no order of priority implied):

- Delays and costs associated with actions and requirements of public and regulatory agencies [E1];
- External market affects UC's ability to recruit and retain capable campus personnel [E2];
- Difficulty in consistently securing quality contractors (includes bid procurement process) [E3];
- Inconsistent quality of construction documents produced by architects [PR1];
- Standard contract language and business processes lack sufficient flexibility to meet some project needs [PR2];
- Failure to provide effective project management and administration throughout the project [PR3];
- Inadequate sharing of information about delivery processes and practices among campuses [PR4];
- Multiple disconnects and lack of coordination within the University at all levels [P];
- Outdated, ineffective, and disconnected budgeting process (resulting in inefficient budget and/or cash flow timing problems) [R1]; and
- Difficulty managing projects under the current overhead limits (limits that do not reflect modern / complex building requirements) [R3].

Focus Group Readiness Assessments

During the half-day sessions at ten locations from June through September 2000, the Focus Group participants discussed each of these ten risk areas and its contributing factors to ensure a common understanding of the risk factor and how it related to each location's capital program. Each Focus Group also identified current business practices at its location that serve to mitigate or manage the identified factors that can cause each risk to have a negative program impact. Following the above discussion process, the participants used anonymous voting technology to assign a quantitative

rating to their location’s current readiness to manage each of the ten program risks and associated contributing factors. Following the voting, the participants identified consequences of not managing the risk and potential future University activities that could improve the management of each risk.

Quantitative Assessment Results– Top 10 University Risks

Participants used the following parameters for assigning a numerical value to their location’s readiness to manage each of the top 10 risk areas:

1 – 3: Unacceptable Readiness - Significant need for improvement in the practices to increase efficiency and effectiveness.

4 – 6: Partial Readiness - Current practices need some improvement to increase efficiency, however, practice is consistently effective.

7 – 9: Acceptable Readiness - Current activities performed represent best practices (i.e. they are fully automated, systems are integrated, benchmarking has been performed, etc.) and the location is ready to address the issues.

The following chart summarizes the assessment scores from the focus groups for each of the 10 key risks affecting the UC Capital Program. Scores are arranged from the highest to lowest level of readiness to address the risk, with the highest scoring risks at the top of the chart.

Top Ten Capital Program Risks (In descending order of readiness score – top to bottom)	Overall (Average)
Failure to provide effective project management and administration throughout the project (PR3)	5.8
Difficulty in consistently securing quality contractors (includes bid procurement process) (E3)	5.4
Inconsistent quality of construction documents produced by architects (PR1)	5.4
Standard contract language and business processes lack sufficient flexibility to meet some project needs (PR2)	5.3
Delays and costs associated with actions and requirements of public and regulatory agencies (E1)	5.2
Multiple disconnects and lack of coordination within the University at all levels (P2)	5.1
Inadequate sharing of information about delivery processes and practices among campuses (PR4)	4.9
Outdated, ineffective, and disconnected budgeting process (resulting in inefficient budget and/or cash flow timing problems) (R1)	4.5
Difficulty managing projects under the current overhead limits (limits that do not reflect modern / complex building requirements) (R3)	4.0
External market affects UC’s ability to recruit and retain capable campus personnel (E2)	3.9

Individual Location Scores (In descending order of readiness score – left to right)									
7.4	7.3	7.3	7.2	6.2	6.1	4.7	4.4	4.1	3.4
7.6	7.4	6.8	5.9	5.8	5.2	4.6	4.6	3.1	2.8
7.4	6.5	6.4	6.2	6.1	5.6	5.5	5.3	3.8	2.9
7.2	6.9	6.8	6.5	4.7	4.7	4.6	4.4	3.5	3.4
6.4	6.4	6.3	6.2	5.9	4.7	4.3	4.3	4.0	3.9
7.0	6.7	6.6	6.0	6.0	4.7	4.0	3.6	3.3	2.6
7.7	6.5	5.1	5.0	4.8	4.8	4.3	3.6	3.5	3.5
7.3	6.5	6.1	5.7	5.5	3.6	3.0	2.7	2.7	2.2
7.4	7.2	6.5	3.6	3.4	2.6	2.6	2.3	2.1	1.9
6.2	4.7	4.6	4.1	3.9	3.6	3.0	2.9	2.8	2.7

All Risks Combined	5.4
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This chart represents an evaluation of a subset of factors involved in managing the risks inherent to the delivery of a complex and growing capital program. As such, the Steering Committee focused on the ten issues having the greatest potential for impacting the success or failure of a project. Each location must also manage the other 18 risk areas identified during the one-on-one interviews, as well as many other issues unique to each project. As one views the above chart, it is important to note that it represents a series of points in time and that each project provides for learning and an opportunity for further refinement and improvement, much as this process of self-examination has provided at each location and for the University as a whole.

This array of responses indicates that campus and OP staff assessed the University's overall readiness to manage the top ten capital program risks at 5.4, which falls within the mid range of the 1-to-9 readiness scale. This overall readiness rating suggests that campus and OP staff involved in the delivery of capital projects believe that current University business practices need some improvement to increase efficiency, yet certain practices across the system are generally effective. It should be noted that this overall assessment by the Focus Groups centered on the ten risks that the Steering Committee identified as posing the greatest threat to the University's ability to achieve its strategic capital program objectives. In other words, this assessment process focused on what those individuals responsible for delivering the University's capital projects felt were the most challenging obstacles to successful project delivery.

While none of the risks were assessed as being managed at an overall "acceptable readiness" level, nine of the top ten risks were assessed at the "partial readiness" level. The focus group participants indicated overall that the University was most ready to address three of the risks:

- Failure to provide effective project management and administration throughout the project (PR3),
- Difficulty in consistently securing quality contractors (E3), and
- Inconsistent quality of construction documents produced by architects (PR1).

In general, these risks scored higher largely because the locations indicated that they have more direct control and influence over them than some of the other risks. Conversely, five or more locations scored three risks at the "unacceptable readiness" level, primarily as the forces driving these risks are to a large degree outside the control of the campus capital programs and therefore more difficult to manage. These three risks are:

- Outdated, ineffective and disconnected budgeting process (R1),
- Difficulty managing projects under the current overhead limits (R3), and
- External market affects UC's ability to recruit and retain capable campus personnel (E2).

Focus group participants discussed each risk before they voted on campus readiness to manage each risk area. As indicated earlier, these facilitated group discussions were often extensive, with voting taking place after the group had reached some

general consensus as to what the risk entailed and what the campus as a whole was doing to address the risk. At most locations, this discussion included representatives from most of the major functional areas involved in capital program delivery, as indicated in Appendix A.

While these quantitative results provide a portrait of campus perceptions of program effectiveness, the quantitative assessment of program readiness should not be interpreted in isolation. The readiness scoring should be reviewed in conjunction with the extensive qualitative information generated during the Focus Group discussions. This information provides a richer, more thorough portrait of current practices throughout the University and documents suggestions by focus group participants for future activities that could strengthen program readiness. In reviewing the record of the discussions for each Focus Group session, it is not surprising that the risk areas encompassing personnel recruitment and retention (risk E2) and budgetary allocations and management (risks R1, R3) received the lowest readiness scores. Both of these areas are greatly impacted by forces external to the campuses and magnified by current conditions in the construction market in California and, to some extent, across the nation. Despite the documented variety of efforts by campuses to recruit and retain quality staff, the public-sector aspects of compensation and working conditions were continuously cited as impediments to maintaining adequate quality and numbers of staff for the increased workload.

Limitations of the University's capital program budget process were also cited as exacerbating difficulties in managing these three risks and as impacting other areas by limiting the resources available to plan and manage many projects. Five campuses indicated they receive no core (19900) funds for the Design and Construction and A&E portions of their organization. The other four campuses indicated that they receive very limited non-project based funding for staffing of A&E and project management portions of the project delivery process. This heavy reliance on project budgets to support project management grew out of the severe budget reductions of the recession of the early 1990's. These reductions resulted in sharp cuts to administrative functions throughout the University, including sharp reductions in the size and support of the capital program. Most of the funding that was shifted away from the capital program to support other priorities during the downturn in the capital program has not been redirected to the capital program, even though the University's capital construction activity has more than doubled in the last several years.

The quantitative ratings and insightful discussions generated at each Focus Group session give rise to the following general observations regarding the University's capital program:

- All locations have developed a multitude of systems and procedures designed to mitigate the business risks inherent to the design and construction of large and complex capital projects;
- While the University has avoided major failure to achieve its stated objectives, the capital delivery infrastructure is under stress at most locations and in multiple areas of the process;

- In the current market environment, some risks are more difficult than others to manage due to controlling external forces. For example, such risks are related to some budgetary decisions and the competition with the private sector for qualified personnel;
- Financial and people resources are thin everywhere and somewhat more so at campuses with relatively smaller programs;
- There is great pressure to deliver multiple and oftentimes complex projects on aggressive schedules, sometimes with insufficient qualified staff and inadequate management and systems support and resources; and
- The Office of the President could provide additional centralized information, coordination, documents, and training that would better support campus efforts.

The results of the Focus Group assessments highlight the similarity of campus experiences in trying to manage the ten major risks faced in the delivery of the University's capital program. The results also highlight considerable diversity in campus efforts to manage each risk. As such, there is a real opportunity to share across the University best practices and knowledge gained with each new project. One Focus Group participant put it this way: "If you keep on doing what you have always done, you will continue to get what you always got!"

Consolidated Inventory of Business Practices Report (Appendix D)

The Focus Group discussions produced a wealth of insights and information regarding current business practices relating to the ten risk areas and the overall management of capital project delivery at the University. The attached Inventory of Business Practices Report presents a consolidation of all quantitative and qualitative results of the sessions held at each University campus and the Office of the President. Results include:

- Quantitative rankings for the ten risk areas and each of the contributing factors;
- Current business practices in place at all locations to manage the program risks consolidated and sorted by contributing factor;
- Consolidated list of consequences inherent to each risk; and
- Additional actions that could strengthen the University's ability to mitigate each risk, consolidated for each risk area.

Recommended Action Items

The following section lists recommended risk-mitigating action items for Campuses and/or the Office of the President. All of these action items were suggested by multiple locations, but none were universal. It should be noted that many locations currently incorporate many of these activities, in whole or in part, in the delivery of their capital projects. If fully implemented by all locations, these actions would greatly increase the University's overall readiness to manage its capital program.

The action items are grouped below under general categories of activity. Some of these items require actions specific to campuses or the Office of the President, but many of the items ultimately require collaboration between all stakeholders to achieve broad impact and acceptability.

Improve Project Budgeting and Funding

Current budget processes were described by many participants as ineffective, disconnected, and outdated, often times resulting in insufficient project budgets. Current processes have also been described as producing inequities in treatment of similar projects at different locations and not providing sufficient flexibility in evaluating cost impacts due to location, complexity and site-specific conditions. In addition, many locations believe that current state-imposed overhead limits do not reflect today's complex building models and requirements, causing difficulties for effective project management. While some locations believe current OP budget allocations and processes can and should be bolstered to ensure better capital project success, others feel current allocations can suffice if project and budget management processes in place on each campus are improved to compensate for budgetary constraints and maximize current allocations.

- Establish a more disciplined approach to soft cost allocations; Chancellors and UCOP need to provide additional core funding for project management rather than relying primarily on project recharge for campus management of projects
- Ensure that adequate funding and related resources are made available at the front-end of projects for necessary pre-planning and programming to enhance the probability for successful project delivery
- Define and control project scope and schedule to improve likelihood of staying within budget by better utilization of project and information management tools (i.e., project tracking reports, Project Planning Guide notifications, existing inventories of facilities renewal and deferred maintenance needs, etc.)
- Prepare and submit project budgets early enough in the project development process to allow adequate time for the design and bid phases of project implementation, but not so far in advance to be outdated by the time project work actually begins
- Develop cost estimates and establish funding levels that take into account current construction costs, regional cost differences, level of project complexity, and site-specific issues faced by each location
- Better define the different budget approaches allowable under state and non-state funded projects, particularly as these approaches relate to soft cost funding (subs 5, 6, 7, and 9) and special items funding (sub-8) to better balance state and other funding source imposed limits

- Clarify the policy that allows campuses to retain and redirect any project savings to other capital projects, an important incentive for seeking and achieving project cost reductions

Improve Project Management - People Issues

Many locations have faced difficulty in recruiting qualified personnel due to noncompetitive compensation plans, poor or non-existent incentive packages, and fewer benefits. In addition, working environments for personnel have been described as difficult, poor and unsupportive, creating high turnover rates.

- Explore modifying pay scales, implementing bonuses, incentives and other compensation strategies, including non-monetary incentives (e.g., training programs, mentoring, continuing education and performance reviews, technological tools and increased administrative support)
- Perform periodic projections of needed staffing levels based upon program activity
- Increase the ratio of junior staff to senior management staff when creating work teams and adapt the studio concept to the project delivery process to create greater organizational efficiency and continuity, as well as to maintain important institutional knowledge among units responsible for capital project implementation
- Increase efforts to recruit and retain competent and experienced project managers and provide them with adequate support, training, and management tools needed for success

Improve Project Management - Systems Issues

An effective business management system has not been established at some locations: the general ledger has not proven useful and some existing project management systems have not been tailored to capital project-specific needs.

- Examine current campus computer systems (e.g., IBEX, PRISM, etc.) to ensure they adequately support all project management functions throughout the delivery cycle
- Ensure that project managers use all of the modules within available business systems to better track project delivery, cost, and performance data
- Acquire and implement an integrated project management system (e.g. PRISM, IBEX, etc.) at campuses that currently operate without such a system

Improve Project Management - Process Issues

Contract language and business processes have been inflexible at many locations and are not meeting project needs as the number and complexity of projects increase. Communication from leadership has been inadequate and delivery processes, personnel, and contracts have often not been managed successfully throughout projects.

- Chancellors need to establish clear capital program goals and objectives and effectively communicate these goals and objectives to all campus leadership across functional areas
- Clearly define and communicate throughout the project delivery organization the roles and responsibilities of project personnel
- Establish post-occupancy reviews and establish a process to review performance of project managers, architects and contractors at project-end
- Improve the architect review process by increasing the scope and expertise involved in architect review to include assessments of documents relative to constructability, mechanical and electrical design, etc.
- Involve operations and maintenance staff from beginning of project design review process
- Develop a design consultant report card based upon performance during design and implementation phases, as well as a building audit at the end of the project
- Establish or further develop and enforce design standards and construction guidelines to improve management of design professionals and contractors
- Establish realistic project delivery schedules that more fully anticipate time and cost uncertainties, including potential impacts of public and regulatory agency actions
- Simplify project documents and revise those not written clearly (i.e., CM agreement needs to be revised and coordinated with other contract forms)

Improve Communication - Internal

Many locations indicated that disconnects exist among various campus functional areas. At some locations, informal communication exists and works well and it is important continue to build those informal communication networks. Similarly, formal communication among OP functional areas has been described by many locations as inadequate. Many UC staff believe that risks associated with the Capital Program could

be reduced if communication and relations improved among functional units at OP and many campus locations.

- Provide opportunities for different campus functional areas to understand each other's roles, to work together and coordinate management of project budgets, and to share best and worst practices and other concerns regarding program delivery
- Create a campus-level and System-wide databases to inventory and share historical and current project information regarding delivery mechanisms used, vendor performance, cost, post-occupancy building performance, etc.
- Improve internal OP coordination among Facilities Administration, the Budget Office, and Office of General Counsel to achieve more timely and consistent responses to campuses on planning and project delivery issues

Improve Communication - External

Many locations emphasized the existence of disconnects between OP and campus functional areas. Communication between OP and campus locations was described as poor in many instances. Strong informal communication has been established and maintained between some campus locations, but are not sufficient between all campuses.

- Improve communication and relations between OP and campus functional areas to encourage better understanding of each other's roles and to better manage information provided to regulatory and other public entities
- Allocate resources and time to educating project clients and University employees to reduce complaints and issues
- Campuses experiencing similar budgeting issues and constraints should work more closely together to share knowledge regarding what does and does not work and to improve communication of issues to OP
- Build consensus between campuses and OP regarding required contract documents and desired outcomes within public bidding constraints
- Establish outreach programs to solicit greater participation by local contractors and to obtain feedback on what's working and not working in the University's project delivery process.
- OP should define and communicate more clearly to the campuses the roles and lines of responsibility of each OP functional area.

- Facilitate cross-functional meetings between appropriate OP and campus functional areas to address campus capital planning and/or specific complex project-related issues

Improve Contract Documents and Policies, Including Ease of Access

Policies, procedures and contract documents have been described as out-of-date, difficult to access, and/or not adequate to meet current program and project needs.

- Examine and update existing construction and design professional contract documents sets and consider:
 - Simplifying and streamlining to deal with conflicting, redundant, unnecessary and unclear language
 - Use of design professional contracts that are closer to AIA Master contract
- Continue to develop new and innovative contract document sets (i.e., design-build, construction manager-at-risk, etc.)
- Establish guidelines for prequalification designed to secure bids from quality contractors
- Develop a system for ease of access and use of up to-date documents, policies, and procedures
- Explore benefits and issues (i.e., impacts on cost, time, quality, etc.) related to use of global contracting for various types of projects to provide more continuity and availability of quality contractors

Improve/Develop Information Sharing Systems and Tools

All UC locations indicated a lack of a University wide benchmark data sharing system. OP has not (to date) provided a central repository of project statistics that would facilitate a data research and comparison center for campuses.

- Develop a database, accessible to the campuses, that would provide information on the performance and experience of construction contractors and design professionals on UC projects
- Develop a project cost and benchmarking database with actual final project costs and information gleaned from post-occupancy evaluations of the building and system performance; database needs to ensure comparability while securing some agreed-upon level of anonymity

Provide/Improve System-wide Training and Advocacy

All campuses strongly oppose an over-controlling OP, yet believe OP could provide great value to campuses by providing information resources and support systems. Some locations believe OP should provide the initial, facilitating role in any effort to establish and maintain good communication and relations across the University and should provide the opportunities for system-wide dissemination of information and educational forums. This suggested role has been described as supportive and resourceful, as opposed to controlling in nature.

- Continue to provide topical PMI sessions on a regular basis covering contracting, project management, legal issues, etc.
- Provide periodic “boot camps” to introduce new staff to the “UC way” and to address other issues resulting from increased staff hiring (due to program growth and high staff turnover)
- Convene and facilitate focused forums to: (1) share best practices; (2) improve communication between OP and the campuses; and (3) develop/enhance project delivery processes, coordination, problem solving, etc.
- Provide leadership for interaction with statewide regulatory agencies that have control over UC’s ability to implement its capital program (i.e., OSHPD, Coastal Commission, SHPO, etc.) to facilitate more consistent, efficient, and timely reviews and approvals (similar to the approach used with the State Fire Marshal program)

Appendix A – List of Focus Group Participants

The following listing displays the names and titles of the 103 UC staff members that participated in the Focus Group sessions held at the nine campuses and the Office of the President. Names with an asterisk () denote the location's representative on the Systemwide Risk Assessment Steering Committee.*

UC Berkeley

John Bono – *Contract Analyst, Capital Projects*
Jeff Gee – *Director of Project Management, Capital Projects*
Tom Lollini – *Director of Physical & Environmental Planning, Capital Planning*
Catherine Montano – *Manager of Contract Administration, Capital Projects*
Ray Shiflett – *Assistant Director, Space Management*
Carol Sypher – *Director, Financial Planning & Budget*
Johnny Torrez - *Director of Physical Plant, Campus Services*
***Langston Trigg** – *Associate Vice Chancellor, Capital Projects*
Barbara Wezelman – *Coordinator, Campus Budget Office*
Virginia Yang – *Assistant Director, Capital Projects*
John Zilber – *Assistant Director, Capital Planning*

UC Davis

***Jill Blackwelder** – *Associate Vice Chancellor, Facilities*
Mike Boyd – *Assistant Dean & Director, Medical Sciences Planning Design & Construction*
Clayton Halliday – *Assistant Director, A&E*
Rick Keller – *Director, Physical, Environmental & Capital Planning*
Jerry O’Hearn – *Assistant Director, A&E*
Louie Slayton – *Assistant Director, Facilities Services*
Bob Strand – *Campus Architect*

UC Irvine

Bob Fritch – *Manager of Construction, Design & Construction*
Lynn Javier – *Manager of Contracts, Design & Construction*
Jaydeane Oehring – *Financial / Administrative Manager, Design & Construction*
Lynn Shoger – *Manager of Project Development, Design & Construction*
*Rebekah Gladson – *Assistant Vice Chancellor and Campus Architect, Design & Construction*
Harry Gunther – *Director, Materiel & Risk Management*
Clifford Stokes – *Project Manager, Design & Construction*
Parrish Dyer – *Project Manager, Design & Construction*
Benny Lau – *Manager, General & Plant Accounting*
Rich Andrews – *Asst. Vice Chancellor, A&FS and Controller*
Sandi Campbell – *Director, Budget Office*
Walt Rice – *Design Manager, Facilities*
Hamid Arabzadeh – *EH&S Specialist, Environmental Health & Safety*
Michael Arias – *Assistant Executive Vice Chancellor*
Karl Wolonsky – *Assistant Dean, Physical Sciences*
Gregory Jue – *Associate Director, Campus & Environmental Planning*
Brian Spindler – *Building Inspector, Design & Construction*

UC Los Angeles

Steven Dolmseth - *Director, Financial Services*
Ronald Enholm - *Principal Project Manager*
Kathy FitzGerald - *Principal Project Manager*
Cynthia Ingham Bachman - *Director, Campus Capital Planning*
Tom LaVanne - *Director Campus Construction Services*
*Sue Santon - *Assistant Vice Chancellor, Campus Capital Programs*
Anne-Marie Spataru - *Director, Health Sciences Projects Administrator*

UC Riverside

Luis Carrazana – *Senior Academic Facilities Planner*
Theodore Chiu – *Principal Architect*
Scott Corrin – *Campus Fire Marshal*
Marc Guerra – *Director*
*Dan Johnson – *Director*
George MacMullin – *Project Manager*
Darius Maroufkhani – *Project Manager*
Fernand McGinnis – *Project Manager*
Eileen O’Connell-Owens – *Associate Director, Finance and Capital Budget*
Tim Ralston – *Interim Associate Director*
Jim Reynolds – *Project Manager*
Tricia D. Thrasher – *Senior Environmental Project Manager*

UC San Diego

Frank Goldston - Manager, Building/Structures, Physical Plant Services
Dennis Goodrich - Medical Center Facilities Management
Brian Gregory – Director, Capital Planning/Budget
Patricia Hawkins - Fiscal Manager, FD&C
*** Boone Hellmann - Assistant Vice Chancellor, Design & Construction**
Marcialene Holcomb – Director, Health Sciences, FD&C
Gerry White - Assistant Director, Engineering Services, FD&C
Nancy Whittemore - Contracts Manager, FD&C

UC San Francisco

***Michael Beebe – Manager, Finance**
Dennis Burick – Controller, Facilities Management
Cindy Fenwick – Associate Vice Chancellor & Controller
Mike Goff – Manager, Utilities Division, Facilities Maintenance
Dave Grego – Deputy & Operations Manager, Facilities Maintenance
Steve Jack – Manager, Major Projects
Julie Lau – Manager, Contracts & Business Services
Juan Martin – Campus Fire Marshal & Manager of Inspections
Gary Nelson – Manager, AD&E
George Obana Jr. – Manager, Building Maintenance & Operations
Mel Rocket – Manager, Building Maintenance & Grounds
Steve Wiesenthal – Associate Vice Chancellor & Campus Architect
Lori Yamauchi – Acting Assistant Vice Chancellor, Campus Planning
Gene Zanko – Senior Planner (CIP), Campus Planning

UC Santa Barbara

Anna Galanis – Director, Contracts
David Gonzales – Director, Physical Facilities
Everett Kirkelie – Associate Vice Chancellor, Architectural Services
Bob Kuntz – Assistant Chancellor, Budget & Planning
Martie Levy – Director, Capital Development
Tye Simpson – Director, Planning
Ron Strahl – Director of Engineering, Design & Construction
***Jack Wolever – Director of Architecture, Design & Construction**

UC Santa Cruz

Steve Ayraud - *Principal Engineer*

John Barnes - *Principal Planner*

Adam Bayer - *Senior Engineer*

Jim Dunne - *Associate Director, Physical Plant*

Anne Gavin - *Business and Accounting Manager*

Meg Holton - *Senior Engineer*

Henry Hooker - *Senior Architect*

Sara Kane - *Senior Architect*

Fran Owens - *Capital Planning and Space Management Director*

Jim West - *Physical Plant Senior Superintendent*

Frank Zwart - *Campus Architect & Associate Vice Chancellor

UC Office of the President

Larry Aull – *Director, State Capital Program Development*

Benjamin G. Flores – *University Counsel*

Margaret R. Goglia – *Associate Director, Design & Construction Policy*

Lori Hoffman – *Director, Non-State Capital Development*

Gary Matteson – *Interim Director, Facilities Management*

Ellie Ross – *Manager, Special Projects*

Jim Smith – *Associate Director, Design & Construction Services

Jack Zimmerman - *Director, Planning, Design & Construction*

Appendix B – Listing of 28 Capital Program Risks Identified During One-on-One Interviews with Steering Committee Members

Environmental Risk Issues

- A. Difficulty managing constituent involvement (users, donors, and other stakeholders)
- B. External market effects on UC's ability to obtain capable campus personnel
- C. Interference from actions of the public and regulatory agencies
- D. Difficulty in consistently securing quality contractors
- E. Constraints imposed by existing campus built environment and natural physical landscape features
- F. Lack of accountability and processes for managing environmental litigation

Processes and Systems Risk Issues

- G. Difficulty in establishing accountability among parties responsible for project delivery
- H. Inadequately defined and implemented commissioning process
- I. Lack of project delivery process guidelines, including guidelines for alternative delivery methods
- J. Lack of historical project documentation, impacting future modifications and adjacent activity
- K. Inadequate sharing of information about delivery processes and practices among campuses
- L. Response from OGC is not timely
- M. Insufficient and outdated program policies and procedures (post-occupancy review, low bid limits, etc.)
- N. Failure to provide effective project administration throughout project (management continuity)
- O. Reluctance by project personnel to challenge appropriateness of project approaches
- P. Inconsistent quality of construction documents produced by architects
- Q. Inadequate review processes (not involving all relevant campus personnel)
- R. Standard contract language lacks sufficient flexibility to meet some project needs

People Risk Issues

- S. Multiple disconnects and lack of coordination within the University at all levels
- T. Difficulty attracting and retaining quality project managers
- U. Risk adversity of project managers and other campus leaders
- V. Inadequate training and mentoring programs

Resource Support Risk Issues

- W. Difficulty managing projects under current overhead limits
- X. Ineffective and disconnected budgeting process (resulting in insufficient budget and/or cash flow timing problems)
- Y. Outdated and inconsistent funding models and guidelines (do not reflect modern/complex building requirements)
- Z. Lack of access to timely project level and university-wide information
- AA. Lack of adequate OP support
- BB. Difficulty receiving adequate support on state funded projects

Appendix C - Campus Operational Objectives

Steering Committee members reviewed and edited the operational objectives identified originally during their individual interviews. Members then rated the extent to which they agreed or disagreed that each objective should be considered a 'core' objective to individual campuses capital programs. Those objectives noted with an asterisk below were considered a core objective by at least 80% of the committee members.

- *1. Establish an inclusive, interactive relationship between all campus capital project functional units
- *2. Design contextually sensitive buildings that support/meet program objectives, and also add to the quality of the environment by improving the neighborhood
- *3. Establish effective online project data management systems
- *4. Hire and retain quality Project Managers
- *5. Maintain appropriate project documents and process
- *6. Align project budget and design with life-cycle costs
- *7. Implement appropriate preplanning studies and analyses
- *8. Effectively manage internal client involvement
9. Explore different funding mechanisms better suited to deliver capital programs that meet campus needs
10. Review current delivery methods and establish alternative methods / strategies
11. Establish a continuous commissioning function across the campus
12. Become the premier design and construction services provider to campus clients
13. Effectively deliver projects consistent with specific design standards
14. Assure rigorous and comprehensive design guidelines are in place through out the University
15. Effectively monitor and respond to the pressures and constraints of the competitive construction industry
16. Effectively budget to meet or exceed the Title 24 energy-efficient benchmark
17. Establish effective post-occupancy evaluation processes
18. Establish a pro-active, effective campus steering committee that addresses capital program risks

**Rating of 18 Campus Operational Objectives
by Steering Committee to Identify Those Core to Most Campuses**

